

## **Multi-Agent-Based Secure Textual Communication**

**Jayathunga, D.P., Ranasinghe, R.M.I.S. and Hoshini, P.A.A.**

Department of Computer Science and Technology, Uva Wellassa University of Sri Lanka

Email: {poornima, iranthe, amalka}@uwu.ac.lk

### **Abstract**

The study designed to show that the security of textual communication can improve by incorporating Agent Technology. Furthermore, the usage of dynamic encryption mechanism tightens the security of the communication. While online communication media are facilitating an effective communication, significant threats are arising day by day due to high access rate of large data. Therefore, privacy, confidentiality, and security become more significant facts in the means of Information and Communication Technology. A network attack or malicious software such as viruses and worms may cause communication failure or loss of data. An intruder can modify, steal or erase a message while it is passing through the communication media. Thus, the importance of information security is increasing rapidly. An agent-based secure communication system is proposed to make more secure transmission of data that will improve the efficiency, security, and robustness. The execution of security protocols in a fair and accessible way by incorporating software agents will be a better approach to overcome the security threats. In this study, autonomous agents have been created and simulated using Java Agent Development Environment (JADE) platform that is skilled with the knowledge of several encryption methods to select the most suitable encryption method based on the message type. Furthermore, an Agent ID is used by every agent for the purpose of identifying each other to communicate. Another essential feature of agents is the ability to communicate with each other using a specific way with the aid of Agent Communication Language (ACL), and it gives a unique way of communication in between agents. A vital aspect of this method is to ensure the security level of the encryption methodology applied. Adding software agent to this process will add one more layer of security other than the encryption. Several benefits can be possible through adopting dynamic encryption method in the system. Secrecy is high, in the means of neither the receiver nor the intruder knows the encryption method which used. Encryption, dynamic encryption, and agent-based approach used to achieve three levels of security in textual communication. Obviously, the security is improved by adding these three tiers, and it is tough to break all these three layers and retrieve the message.

**Keywords:** *Multi-Agent System, Java Agent Development Environment (JADE), dynamic encryption, Security,*